

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

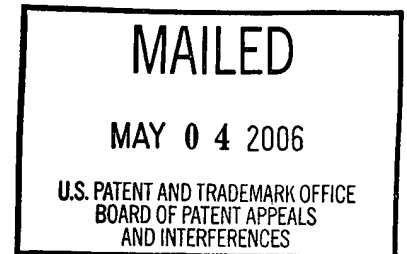
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASATO SUMIKAWA and KAZUMI TANAKA

Appeal No. 2006-1341
Application No. 09/782,180

ON BRIEF



Before KIMLIN, WALTZ and KRATZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-18.
Claim 1 is illustrative:

1. A semiconductor device comprising:

a semiconductor substrate having a surface provided with an external connection electrode and;

a surface opposite that with said external connection electrode, abraded with a mirror finish and reinforced with a back-surface reinforcement member.

The examiner relies upon the following references as evidence of obviousness:

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Tamaki et al. (Tamaki)	6,136,668	Oct. 24, 2000
Sakaguchi et al. (Sakaguchi)	6,150,194	Nov. 21, 2000
Takahashi et al. (Takahashi)	6,153,448	Nov. 28, 2000
Horiuchi et al. (Horiuchi)	6,242,799	Jun. 5, 2001
Ohuchi	6,271,588	Aug. 7, 2001
Toyosawa	6,337,257	Jan. 8, 2002

Appellants' claimed invention is directed to a semiconductor device, and method of making it, comprising a substrate having an external connecting electrode on one surface and having the opposite surface abraded with a mirror finish. The surface of the substrate having a mirror finish is provided with a reinforcement member, such as a coating of resin. According to appellants "the semiconductor device has a reduced thickness so that it can bend while a level of rigidity can be assured as the semiconductor is reinforced with a back surface reinforcing member of resin" (page 3 of principal brief, first paragraph).

The appealed claims stand rejected under 35 U.S.C. § 103(a) as follows:

- (a) claims 1 and 17 over Toyosawa,
- (b) claims 2 and 4 over Toyosawa in view of Ohuchi,
- (c) claim 3 over Toyosawa in view of Ohuchi and Horiuchi,
- (d) claims 5-8 and 18 over Tamaki,
- (e) claims 9-12 over Tamaki in view of Sakaguchi, and

(f) claims 13-16 over Tamaki in view of Takahashi.

In accordance with the grouping of claims set forth at pages 5 and 6 of the principal brief, claims 6-12 stand or fall together, as do claims 13-16.

We have thoroughly reviewed each of appellants' arguments for patentability. However, we are in complete agreement with the examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of Section 103 in view of the applied prior art. Accordingly, we will sustain the examiner's rejections for essentially those reasons expressed in the answer, and we add the following primarily for emphasis.

We consider first the rejection of claims 1 and 17 over Toyosawa. There is no dispute that Toyosawa discloses a semiconductor substrate having a back surface 36 that is ground and polished to a mirror smooth surface (see appellants' acknowledgment at page 7 of the principal brief, second paragraph). While appellants maintain that the reference disclosure does not suggest the physical structure of the claimed abraded back surface, we find no meaningful distinction between the mirror surface of the reference and that presently claimed, and appellants have not explained any such distinction. Also, as

pointed out by the examiner, claim 1 is an article claim defining a mirror finish made by a process step, and claim 17 simply requires a mirror finished surface without regard to how it is made.

Concerning the claimed reinforcement member on the mirrored surface, we agree with the examiner that the protective tape on surface 36 of Toyosawa's device meets the claimed requirement (see column 12, lines 27-31). While appellants contend that "the protective tape is used only in a manufacturing step and does not form structure of the chip in the context claimed" (page 7 of principal brief, second paragraph), the rejected claims are sufficiently broad to encompass devices which receive a further processing step.

We are also not persuaded by appellants' argument that the terms "reinforcement" and "protective" have different meanings in the semiconductor art. The rejected claims do not define any degree of reinforcement and we concur with the examiner that the protective tape of the reference "inherently makes stronger the semiconductor chip 32 and strengthens it by additional material or support," at least to some degree (page 8 of answer, fourth paragraph).

Regarding claims 2 and 4, we agree with the examiner that Ohuchi evidences the obviousness of using a resin material for the protective tape of Toyosawa. While appellants contend that the combination of specific resins provide unexpected results, claim 2 does not specify any type of resin, and a portion of the specification cited by appellants hardly establishes that the selection of any of the various resins recited in claim 4 achieves results that would be truly unexpected to one of ordinary skill in the art. Appellants rely upon no objective evidence which compares the use of the claimed resins with other types of resins. Indeed, the cited portion of the specification provides no objective data.

Concerning claim 3, appellants have not rebutted the examiner's legal conclusion that it would have been obvious to employ the particular resin of Horiuchi, having a Youngs modulus falling within the claimed range, as the protective tape of Toyosawa. Appellants' argument focuses upon the same argument against the rejection of claims 2 and 4, namely, that the protective tape of Ohuchi is not a reinforcement tape in the final article. Again, however, we emphasize that the claims on appeal do not preclude removal of the reinforcement member during a latter stage of processing.

We now turn to the rejection of claims 5-8 and 18 over Tamaki. As set forth by the examiner, the back surface of Tamaki's semiconductor wafer 4a is polished to a mirror finish and is coated with a reinforcing resist material 33. For some reason appellants' arguments in the principal and reply briefs focus upon adhesive 31 for reinforcing plate 21, but appellants fail to explain why resin layer 33 of Tamaki, cited by the examiner, fails to meet the claim 5 recitation of "applying resin on said surface abraded."

Appellants also maintain that "claim 5 distinguishes over the reference [Tamaki] because claim 5 abrades to a mirror finish" (page 10 of principal brief, penultimate paragraph). However, appellants have not refuted the examiner's reasonable position that the step of "grinding to a mirror finish is equivalent to abrasing" (page 11 of answer, first sentence). Also, we agree with the examiner that one of ordinary skill in the art would have understood that the functional device 3 of Tamaki can be the claimed external connection electrode. In addition, appellants have not rebutted the examiner's finding that "metal layer 5 is an electrical connection for the semiconductor package" (page 11 of answer, third paragraph).

Concerning the separately rejected claims 9-12 and 13-16 over Tamaki in view of Sakaguchi and Takahashi, respectively, we have no doubt that one of ordinary skill in the art would have found it obvious to apply the resin by the well-known techniques of printing or spin-coating. While appellants make reference to the specification for disclosing that the application of the resin by printing or spin-coating allows highly viscous resins to be applied in desired amounts and thicknesses, appellants have not established that such disclosure would be considered truly unexpected by one of ordinary skill in the art. In re Merck & Co., 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986); In re Klosak, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). In order to demonstrate unexpected results it is appellants' burden to establish that objective data supporting unexpected results is commensurate in scope with the degree of protection sought by the appealed claims and represents a fair comparison with the closest prior art. Appellants have referenced no such data in the principal and reply briefs on appeal.

In conclusion, based on the foregoing, and the reasons well-stated by the examiner, the examiner's decision rejecting the appealed claims is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Edward C. Kimlin
EDWARD C. KIMLIN
Administrative Patent Judge

THOMAS A. WALTZ
Administrative Patent Judge

BOARD OF PATENT
APPEALS AND
INTERFERENCES


PETER F. KRATZ
Administrative Patent Judge

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